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EXAMINER

TRAN, TRANG U

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/560,448	Applicant(s) BOURRET ET AL.	
	Examiner Trang U. Tran	Art Unit 2422	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 20-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 20-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed August 09, 2010 have been fully considered but they are not persuasive.

In re page 17, applicants offer the submission of the Notice of Allowance of U.S. Patent Application No. 10/558,673 if the Examiner has no access to this Notice of Allowance.

In response, the Examiner has access to the Notice of Allowance of U.S. Patent Application No. 10/558,673 and, therefore, the submission of the Notice of Allowance is not needed at this time.

In re page 17, applicants requests approval and acceptance of the amendments to the drawings on July 28, 2009 including a replacement sheet of drawings and an annotated sheet showing the changes.

In response, the amendments to the drawings filed on July 28, 2009 have been approved and accepted.

In re pages 17-18, applicants request that the rejection under 35 U.S.C. § 101 is withdrawn because the claims have been amended by adding "non-transitory" before "computer readable storage medium" as suggested by the Examiner.

In response, the rejection of claims under 35 U.S.C. § 101 is herein withdrawn.

In re pages 18-22, applicants argue, with respect to the 102 rejection, that Hu fails to disclose every claim element of the claimed invention. For example, Hu fails to disclose "matching, by execution of a computer system, sub-field/frame elements of a

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test video field/frame with corresponding sub-field/frame elements of at least one reference video field/frame, and thereby generating for the test video field/frame a matched reference field/frame comprising the sub-field/frame elements of the at least one reference video field/frame which match to the sub-field/frame elements of the test video field/frame; [and] positioning, by execution of the computer system, in the matched reference video fields/frame at least one of the matching sub-field/frame elements to compensate for misalignment between at least one of the sub-field/frame elements of the test video field/frame and the at least one matching sub-field/frame elements," as required by independent claims 1 and its dependents, fails to disclose "matching sub-field/frame elements of a test video field/frame with corresponding sub-field/frame elements of at least one reference video field/frame, and thereby generating for the test video field/frame a matched reference field/frame which match to the sub-field/frame elements of the test video field/frame; [and] shifting, by execution of the computer system, relative to the matched reference field/frame at least one of the matching sub-field/frame elements to compensate for misalignment between at least one of the sub-field/frame elements of the test video field/frame and the at least one matching sub-field/frame elements," as required by independent claim 17 and its dependents, and similar comments apply to independent claim 20 and its dependents because the invention of the independent claims provides compensation for the complex misalignments that may occur within a field or frame, where different parts of a video field or frame might be subject to different shifts, scaling, or delay and these

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misalignments within a field or frame (i.e. affecting a sub-field/frame element) are not addressed by Hu.

In response, the examiner respectfully disagrees. It is noted the claimed "affecting a sub-field/frame element" can be interpreted as "affecting a sub-field **or** frame element". It is noted that claims are not limited to **only sub-field element but include frame element**. Thus, Hu anticipates the claims because they include frame element.

In re pages 22-24, applicants argues, with respect to the 103 rejection, that independent claims are allowable for the same reasons as discussed in the independent claims above and that Wolf fails to teach or suggest the act to minimize the effects of sub-field/frame misalignments that are imperceptible to the human viewer.

In response, the examiner respectfully disagrees. As discussed above, the claims are not limited to only sub-field but include frame element. It is further noted that the process of Wolf to minimize the effects of sub-field/frame misalignments that are imperceptible and perceptible to the human viewer as required by claims.

Claim Rejections – 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1-6, 17, 20-25, 36-40 and 51-53 are rejected under 35 U.S.C. 102(e) as being anticipate by Hu (US Patent No. 6,483,538 B2).

In considering claim 1, Hu discloses all the claimed subject matter, note 1) the claimed matching, by execution of a computer system, sub-field/frame elements of a test video field/frame with corresponding sub-field/frame elements of at least one reference video field/frame, and thereby generating for the test video field/frame a matched reference field/frame comprising the sub-field/frame elements of the at least one reference video field/frame which match to the sub-field/frame elements of the test video field/frame is met by the video capture 16 which captures corresponding images or frames from the test image and the reference image (Figs 1-2, col. 2, lines 31-59), 2) the claimed positioning, by execution of the computer system, in the matched reference video fields/frame at least one of the matching sub-field/frame elements to compensate for misalignment between at least one of the sub-field/frame elements of the test video field/frame and the at least one matching sub-field/frame elements is met by the high precision sub-pixel spatial alignment detect module 18 and the position shift module 20 (Figs 1-3, col. 2, line 31 to col. 3, line 55), and 3) the claimed generating, by execution of the computer system, a video quality value in dependence on the matched sub-field/frame elements of the test and matched reference video fields/frames so as to reduce the adverse effects of sub-field/frame misalignments between the reference and test field/frames is met by the Picture Quality Analyzer 22 (Figs 1-2, col. 2, line 31 to col. 3, line 55).

In considering claim 2, the claimed wherein the matching step further comprises, for a sub-field/frame element of the test video field/frame, searching for a matching sub-field/frame element within M1 preceding and/or M2 succeeding reference video fields/frames to a temporally corresponding reference video field/frame to the test video field/frame is met by the test region of block 28 which is overlaid on both reference and test images (Figs 1-3, col. 2, line 31 to col. 3, line 55).

In considering claim 3, the claimed wherein M1 and M2 are predefined is met by the test region of block 28 which is overlaid on both reference and test images (Figs 1-3, col. 2, line 31 to col. 3, line 55).

In considering claim 4, the claimed wherein the searching further comprises searching within a spatially bounded region of the reference video fields/frames about the corresponding position within the reference fields/frames as the test sub-field/frame element takes within the test video field/frame is met by the test region of block 28 which is overlaid on both reference and test images to a correlation measurement module 32 (Figs 1-3, col. 2, line 31 to col. 3, line 55).

In considering claim 5, the claimed wherein the spatial bound of the search region is predefined is met by the test region of block 28 which is overlaid on both reference and test images to a correlation measurement module 32 (Figs 1-3, col. 2, line 31 to col. 3, line 55).

In considering claim 6, the claimed wherein the matching further comprises, for a sub-field/frame element of the test video field/frame: defining a matching template comprising a portion of the test video field/frame including the sub-field/frame element;

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and using the defined matching template to search for matching sub-field/frame elements in the at least one reference video field/frame is met by the test region of block 28 which is overlaid on both reference and test images to a correlation measurement module 32 (Figs 1-3, col. 2, line 31 to col. 3, line 55).

Claim 17 is rejected for the same reason as discussed in claim 1 above.

Claims 20-25 are rejected for the same reason as discussed in claims 1-6, respectively.

Claims 36-40 are rejected for the same reason as discussed in claims 2-6, respectively.

In considering claim 51, the claimed wherein said positioning includes positioning a plurality of the matching sub-field/frame elements to compensate for misalignments between a plurality of the sub-field/frame elements of the test video field/frame and the plurality of the matching sub-field/frame elements is met by the high precision sub-pixel spatial alignment detect module 18 and the position shift module 20 (Figs 1-3, col. 2, line 31 to col. 3, line 55).

Claim 52 is rejected for the same reason as discussed in claim 51 above.

Claim 53 is rejected for the same reason as discussed in claim 51 above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7-10, 26-29 and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hu (US Patent No. 6,483,538 B2) in view of Wolf et al. (US Patent No. 5,446,492).

In considering claim 7, Hu discloses all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed wherein the matching further comprises calculating one or more matching statistic values and/or matching vectors; and wherein the generating step generates the video quality parameter in further dependence on the calculated matching statistic values and/or matching vectors. Wolf et al teach that the source and destination spatial statistics processors 22 and 30 compute the standard deviation of the pixel contained within the Region Of Interest (ROI) for which the video quality is to be measured, the ROI may be the entire image, but preferably it is a small subset of the pixels forming the entire image (Fig. 2, col. 6, line 3 to col. 8, line 38). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the calculating statistic value as taught by Wolf et al into Hu's system in order to provide a method of measuring video quality that agrees closely with the perceptual video quality obtained from large panel of human viewers.

In considering claim 8, the claimed wherein the calculating comprises: constructing one or more histograms relating to the searched area (s) of the reference video field (s)/frame (s); and calculating a matching statistic value for each histogram relating to the proportion of matched elements which contribute to the peak of the histogram is met by the source and destination spatial statistics processors 22 and 30

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compute the standard deviation of the pixel contained within the Region Of Interest (ROI) for which the video quality is to be measured, the ROI may be the entire image, but preferably it is a small subset of the pixels forming the entire image (Fig. 2, col. 6, line 3 to col. 8, line 38 of Wolf et al).

In considering claim 9, Hu discloses all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed wherein the generating further comprises: calculating a plurality of video characteristic values respectively relating to characteristics of the test and/or reference video fields/frames in dependence on the matched sub-field/frame elements of the test and reference video fields/frames; and integrating at least the calculated video characteristic values together to give the video quality value. Wolf et al teach that the source features 7 and the destination features 9 are used by the quality processor 35 to compute a set of quality parameters 13 (p_1, p_2, \dots) and quality score parameter 14 (q), ...the design process determines the internal operation of the statistics processors 22, 24, 30, 32 and the quality processor 35 (Fig. 2, col. 4, line 8 to col. 5, line 38). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the calculating plurality of the video characteristic values as taught by Wolf et al into Hu's system in order to provide a method of measuring video quality that agrees closely with the perceptual video quality obtained from large panel of human viewers.

Claim 10 is rejected for the same reason as discussed in claim 7 above.

Claims 26-29 are rejected for the same reason as discussed in claims 7-10, respectively.

Claims 41-44 are rejected for the same reason as discussed in claims 7-10, respectively.

6. Claims 11-16, 30-35 and 45-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hu (US Patent No. 6,483,538 B2) in view of Wolf et al. (US Patent No. 5,446,492), and further in view of Kuhn (US Patent No. 6,295,083 B1).

In considering claim 11, the combination of Hu and Wolf et al disclose all the limitations of the instant invention as discussed in claims 1 and 9 above, except for providing the claimed wherein the video characteristic values are respectively any two or more of the following values: one or more spatial frequency values; one or more texture values; at least one edge value; at least one luminance signal to noise ratio value; and/or one or more chrominance signal to noise ratio values. Kuhn teaches that as shown in Fig. 2 the cross-correlation from the locating stages provides an integer pixel shift, this integer pixel shift is used to locate the data from image that is centered on a significant feature of the alignment pattern, such as a rising and/or falling edge (Figs. 1C and 1D, col. 3, line 5 to col. 4, line 3). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the edge values as taught by Kuhn into the combination of Hu and Wolf et al's system in order to high precision image alignment detection for the registration of two images.

In considering claim 12, the claimed wherein the calculation of the edge value comprises, for a test field/frame: counting a number of edges in each sub-field/frame element of the test field/frame; counting a number of edges in each sub-field/frame element of the at least one reference field/frame matched to the sub-field/frame

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elements of the test field/frame; and determining an edge value for the test field/frame in dependence on the respective counts is met by the buffer register stores the values of a group of pixels surrounding both the rising and falling edges of the alignment blocks (Figs. 1C and 1D, col. 3, line 5 to col. 4, line 3 of Kuhn).

In considering claim 13, the claimed wherein the determining further comprises: calculating difference values between each pair of respective counts; putting each calculated difference value to the power Q ; summing the resulting values to give a sum value; and putting the sum value to the power $1/Q$ to give the edge value is met by calculating the different between the pixel and the pixel shift (Figs. 1C and 1D, col. 3, line 5 to col. 4, line 3 of Kuhn).

In considering claim 14, the combination of Hu and Wolf et al disclose all the limitations of the instant invention as discussed in claims 1 and 9 above, except for providing the claimed wherein the integrating further comprises weighting each value by a predetermined weighting factor; and summing the weighted values to give the video quality value. Kuhn teaches that the shifting of the image is performed by interpolation using an appropriate filter such as a linear or $\sin x/x$ filter (Fig. 3, col. 4, lines 4-64 of Kuhn). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the interpolation as taught by Kuhn into the combination of Hu and Wolf et al's system in order to assure that corresponding images to be measured for picture quality are aligned to provide the most accurate determination of picture quality.

In considering claim 15, the claimed wherein the summing is further arranged to sum the weighted values with a predetermined offset value is met by the shifting of the image is performed by interpolation using an appropriate filter such as a linear or $\sin x/x$ filter (Fig. 3, col. 4, lines 4-64 of Kuhn).

In considering claim 16, the claimed wherein the weighting factors and the offset value are dependent on the type of the test and reference video fields/frames is met by the shifting of the image is performed by interpolation using an appropriate filter such as a linear or $\sin x/x$ filter (Fig. 3, col. 4, lines 4-64 of Kuhn).

Claims 30-35 are rejected for the same reason as discussed in claims 11-16, respectively.

Claims 45-50 are rejected for the same reason as discussed in claims 11-16, respectively.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trang U. Tran whose telephone number is (571) 272-7358. The examiner can normally be reached on 9:00 AM - 6:30 PM, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jefferey F. Harold can be reached on (571) 272-7519. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

October 12, 2010

/Trang U. Tran/
Primary Examiner, Art Unit 2422

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